1-2019

The world in 2019

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The Economist Intelligence Unit

Geopolitical jitters: Trade, volatility and the return of risk

a. The world in 2019
b. The economics of artificial intelligence

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The world in 2019

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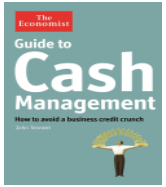
The tide turns

The trade war is causing growth to recede from its 2018 peak

Growth will be a bit slower

- Rising tariffs and protectionism causing a drag on the global economy
- Weaknesses in China's domestic economy
- Turbulence in Argentina and Turkey
- Still some good growth stories: India, ASEAN, parts of Africa
- Germany slows down 1.2%

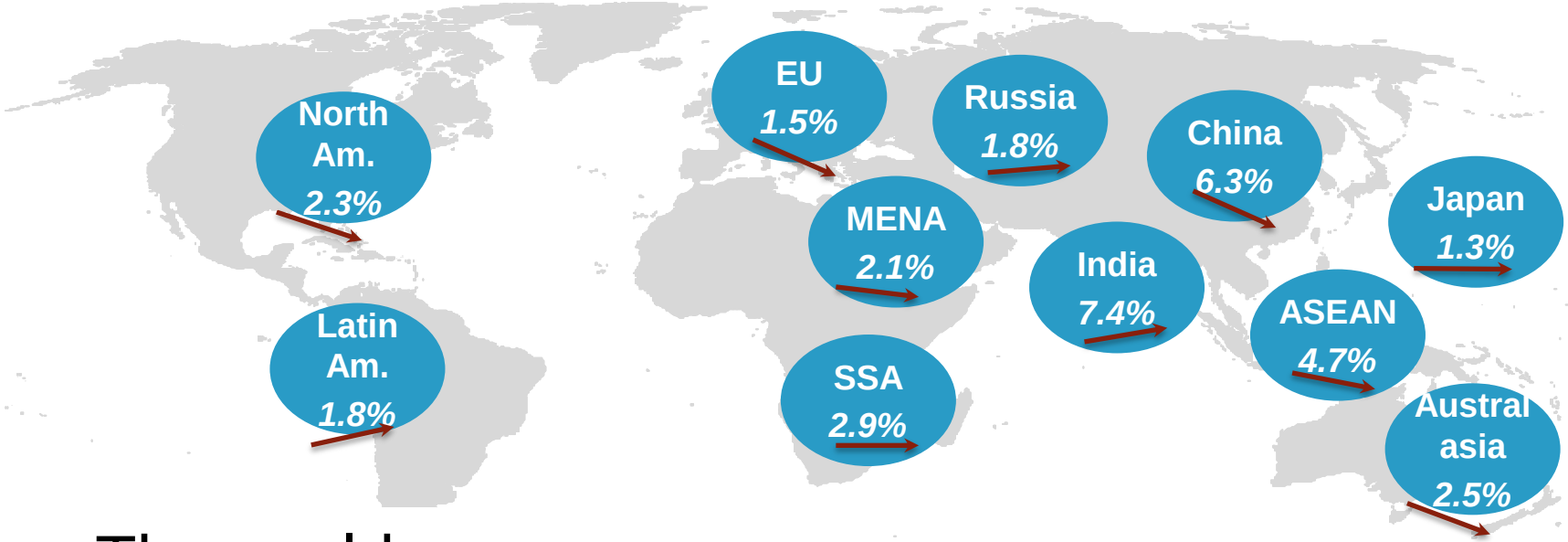


Monetary policy still tightening

- Two rate hikes expected in 2019, J. Powell's hawkish tone, closer to neutral rate (data dependent)
- Corporate earnings, EM sales low, 1 hike possible
- Impact of partial China tightening, deleveraging campaign- Question of an emerging markets currency crisis averted for the time being

Alliances in flux

- US tensions with traditional allies, transactional approach to trade
- Article 50 to be extended; Mar 29th not likely; negotiations continue; no deal unlikely
- Supply chains looking to diversify; regional trade
- Middle East issues complex and deepening: energy risk



The world economy in 2019 to grow by **2.8% (from 3%)**

Source: The Economist Intelligence Unit

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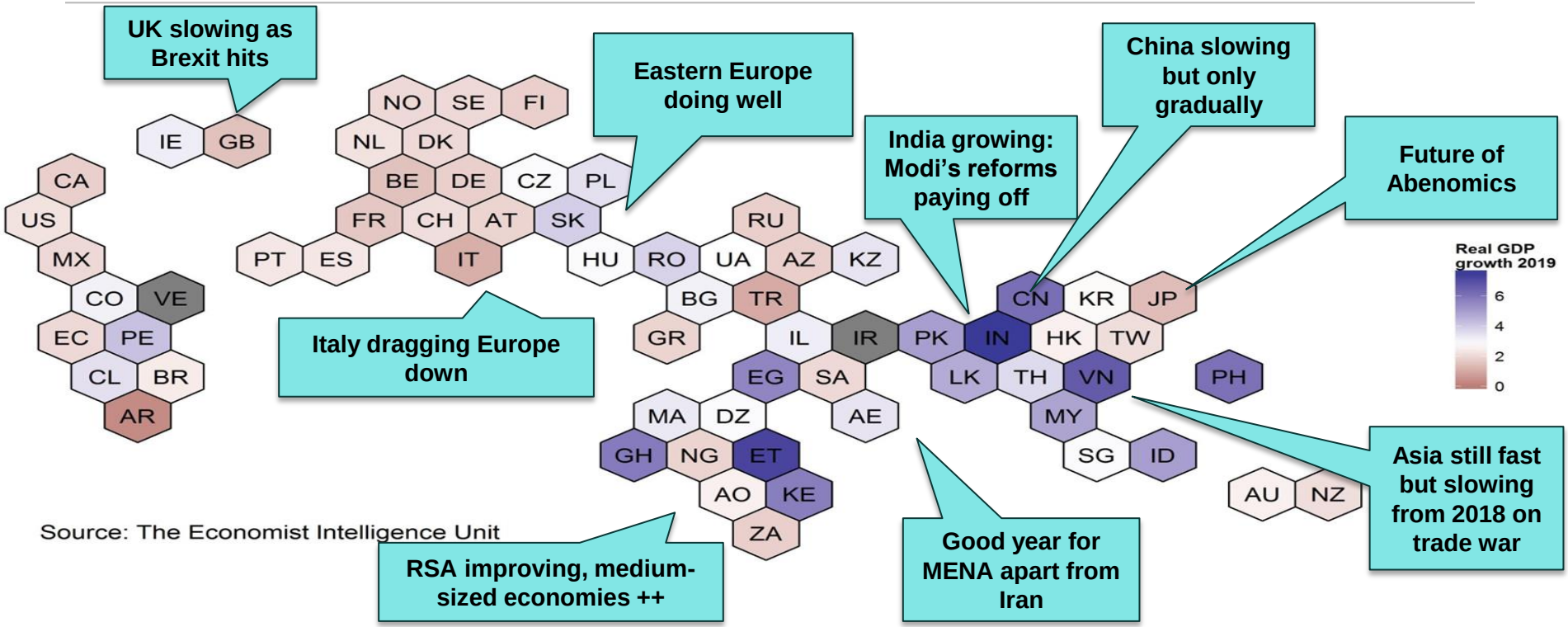
Country politics means the growth story is mixed

Asia remains the world's fastest growing region (political stability in JP, IN, CN)



Blue = growth faster than global average
Red = growth slower than global average

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Trade war to dampen growth

China and the US in disagreement over intellectual property and China's technology transfer practices

US drawing others into the rivalry through the USMCA provision aimed at increasing the trade pressure on China

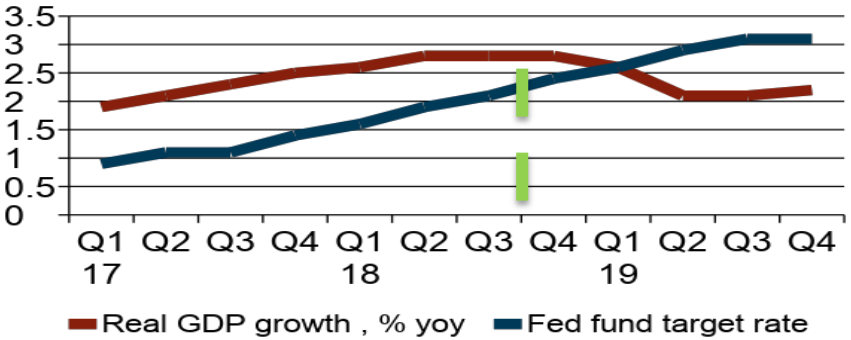
US VP Pence raised allegations of China meddling in US politics ahead of the mid-term elections, also BRI, Made in China 2025 and Taiwan

Global system expected to be characterised by competition between the US and China in the next five years

US economy weakens

Growth will slow to 2.3%, but the Fed will have to keep raising interest rates

Impacts of trade war, maturing business cycle, waning impacts of tax-cuts



Risk Scenarios	Level of Risk	Level of Impact
Stockmarket crash tips the US into recession	Moderate	High
Deadlock in Congress makes the US ungovernable	High	Moderate
Trump is impeached	Low	Very High
US withdraws from NAFTA	Low	Very High

Fed to raise interest rates twice in 2019

- Target rate at 2.9% end-2019
- Investment boom to fade after tax cuts, and government spending growth will have to slow
- Dollar should stay strong to mid-2019, but vulnerable to risks

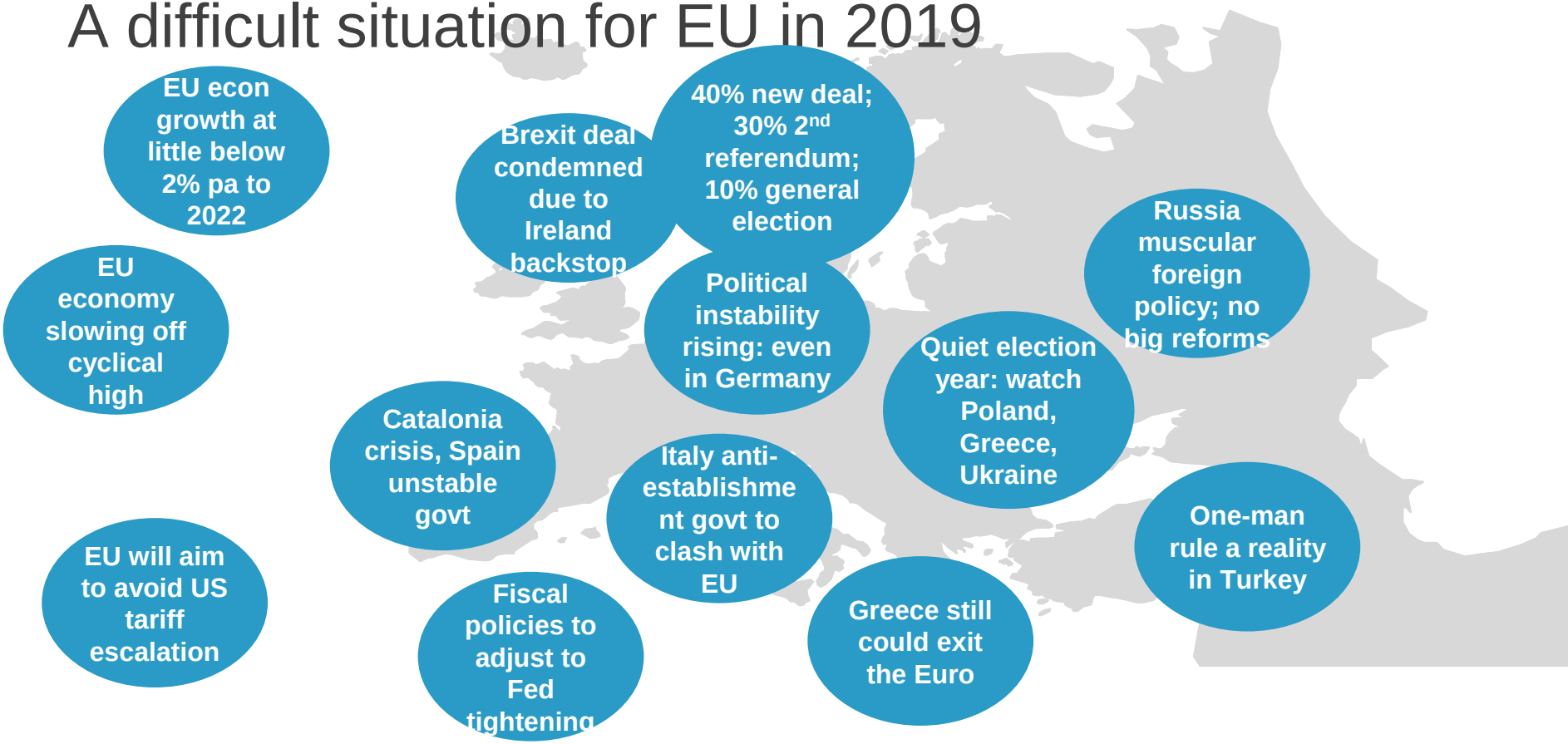
Trump is now stronger and more decisive

- Political risk to Trump is the Russia probe
- Trade tensions with China are starting to weigh on agriculture and manufacturing
- Divided Congress puts aggressive international action to the fore

The support that trade has been giving to China's slowing domestic economy will fade in 2019

- Trade war expected to dampen growth: GDP growth will slow down from 6.6% this year to 6.3% in 2019
- Momentum in both private consumption and investment has weakened
- Disruption expected in a number of provinces that rely heavily on trade
- Taking the back-seat: unsold housing stock; Debt-GDP controls
- Stimulus: lowering reserve requirement ratio100bps

A difficult situation for EU in 2019



Trump's Iran actions raised the oil price

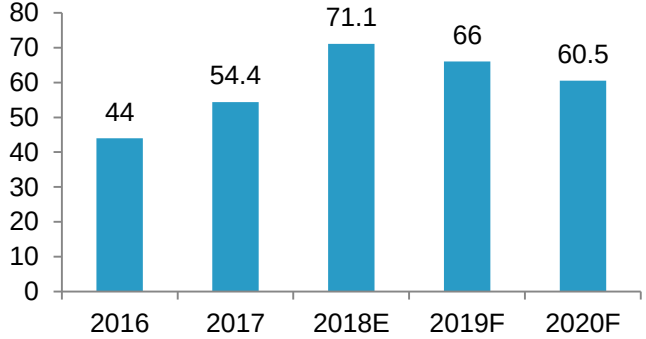
Overall, oil prices should fall through the forecast period

A number of potential political and security risks threaten the oil market: possible Russia sanctions; any Saudi-Iran conflict escalation; fragility in Nigeria, Libya and Iraq

Supply overhang; demand falling

- Supply concerns drove oil high in Sep-Oct
- OPEC not fully offsetting supply losses from Venezuela and Iran, but US wants Saudi to payback after dropping Iran deal
- Russia flexibility in supply
- Iran "ghost tankers" issue crackdown - risks
- China slowdown and record US oil production to weigh in 2019/20

Dated Brent Blend; US$/ barrel



Source: The Economist Intelligence Unit

The US-China trade war will continue for years

We do not expect that this will deepen into a global trade war, however

The US has broken from Japan/EU and towards China in wanting a unilateral, not multilateral, approach and moving from qualified support for free trade to protectionism and attacks on multilateral system

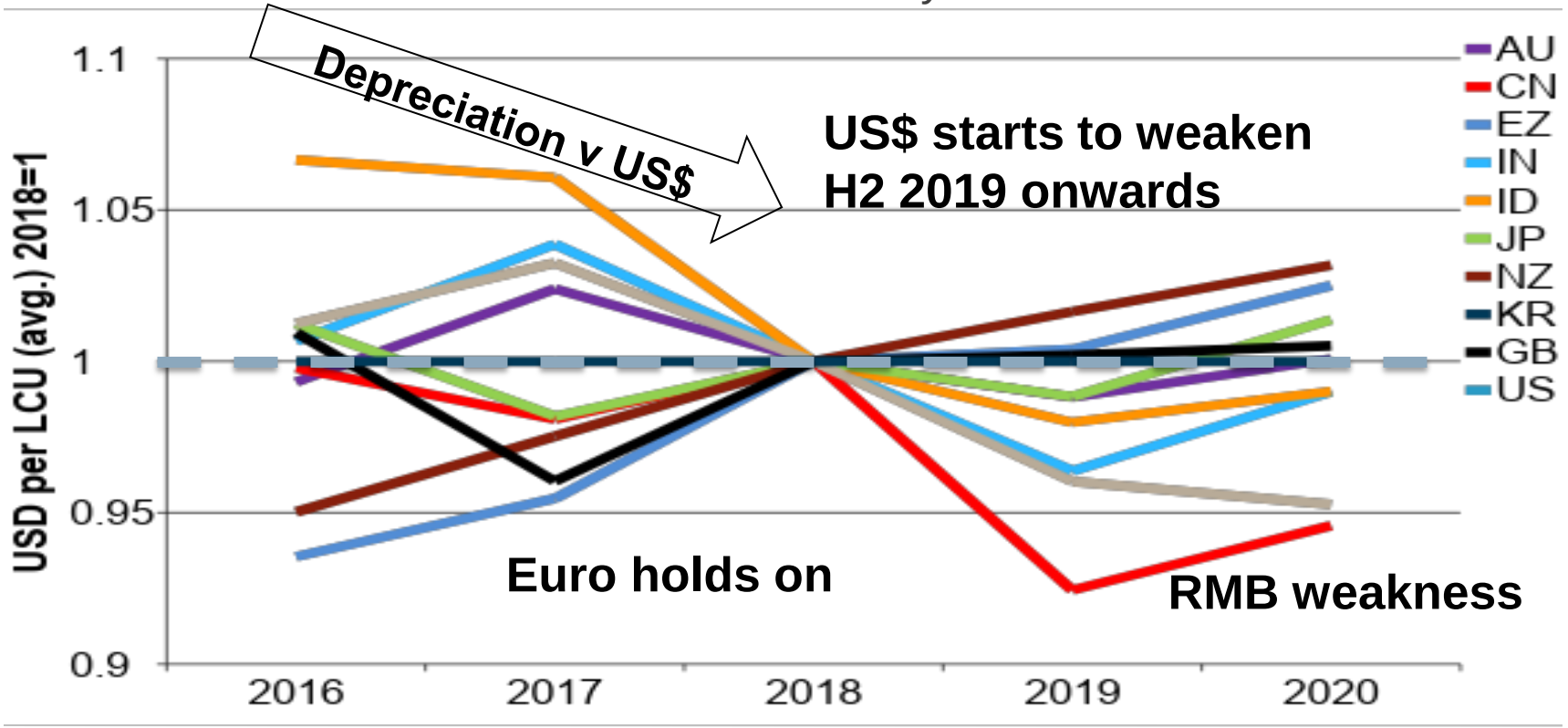
Technology the real battleground between the US and China. It is hard to see common ground, and so we expect the dispute to linger for years. Business of Chinese tech firms with US allies will come under more scrutiny and restrictions. More controls on semiconductors and microchips.

Tariffs are likely to end up being imposed on most of the China-US goods trade

Will Trump be able to get its allies to all put pressure on China? So far: no. But the recent APEC summit shows that the right approach by the US can bring allies along with it. Was APEC a one-off, or the start of a more sophisticated approach? United pressure would probably elicit concessions from China.

Dollar to be strong vs EMs, stable vs G10 in 2019

US$ will weaken in 2020 as the US business cycle turns and the Fed cuts rates



Global forecast risks in 2019

Scenario	Intensity
- US-China trade conflict morphs into a full-blown global trade war (EU cars) *(Moderate risk; very high impact)*	15
- Supply shortages lead to a globally-damaging oil-price spike *(Moderate risk; high impact)*	12
- Contagion spreads to create a broad-based EM crisis (key: Argentina, Turkey banking) *(Moderate risk; high impact)*	12
- Faster than expected US monetary tightening triggers a global slowdown (inflation, easing trade tensions, higher growth) *(Low risk; very high impact)*	10
- China suffers a disorderly and prolonged economic downturn (housing, debt, bubble) *(Low risk; very high impact)*	10

Global forecast risks in 2019

Scenario	Intensity
There is a major military confrontation on the Korean peninsula (US reverts to a containment strategy, 10-20yrs to see progress, possible missteps) *(Low risk; very high impact)*	10
Proxy conflicts in the Middle East develop to disrupt global energy markets (Saudi vs. Iran, risk of more aggressive foreign policy in KSA under crown-prince) *(Moderate risk; moderate impact)*	9
Cyber attacks and data concerns cripple parts of the internet *(moderate risk; moderate impact)*	9
Disputes in SCS lead to hostility (maritime defence, loss of US control) *(Low risk; high impact)*	8
Political gridlock leads to a no-deal Brexit *(Very low risk; low impact)*	2

The economics of artificial intelligence

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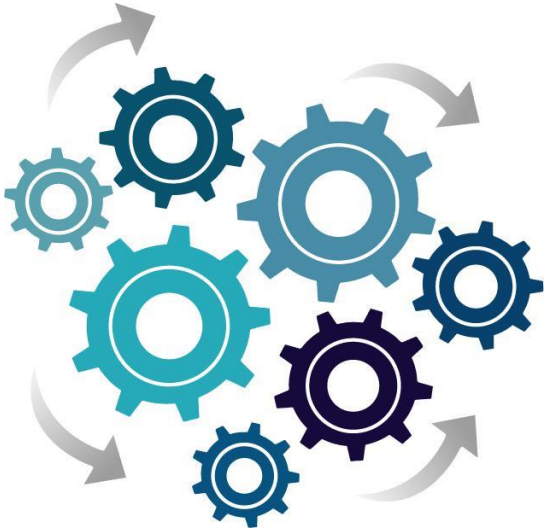
Technological change is led by four key technologies

Internet of Things

- Industrial IoT
- ‘Smart’ factories
- ‘Smart’ homes

Artificial intelligence

- Google’s DeepMind
- Customer service
- Predictive services



Big Data

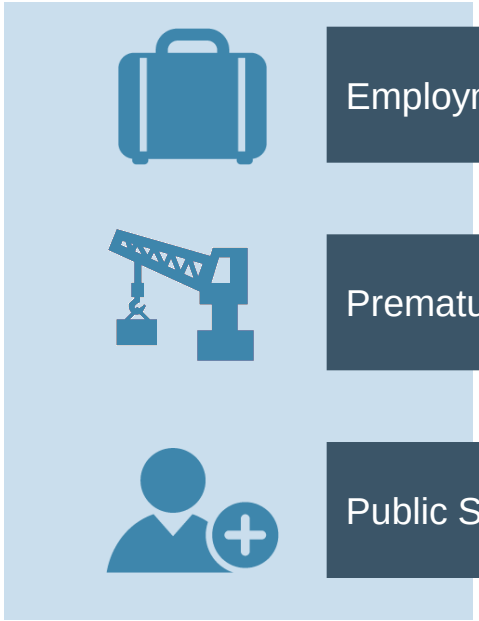
- Data generated by IoT
- AI and machine learning fuelled by Big Data

Robotics and Automation

- Self-driving vehicles
- Elderly care robotics
- Robots for warehouses

Existing discourse revolves around three focus areas

Current literature presents a contested narrative regarding risks and opportunities of automation



Employment

Estimates of jobs at risk vary significantly (gender; tasks vs. jobs; social overheads)

Premature Deindustrialisation

Early withering of industry in developing countries; productivity lags, reshoring; export reliance

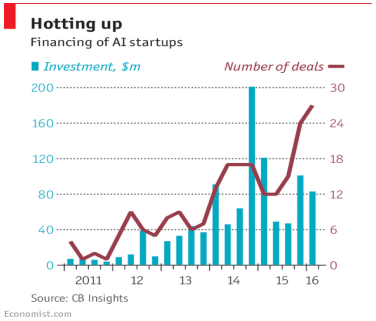
Public Services

Efficient and less-bureaucratic services, however can have embedded biases

Policy drivers: the “compounding effect”

2 positive growth scenarios + 1 negative inaction scenario

Affirmative, informed policymaking action can accentuate the upside and mitigate the potential downside. A lack thereof could make countries worse off than in the baseline



What might policymakers do?

- Education / upskilling efforts — (+)
- Greater investment in computer capital — (+)
- Improved access to open source data
- NOTHING — (-)

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Numerical forecasting (CA) vs. Econometric modelling

Re-configuring a country's production function *(Hanson 2001)*

1. $\ln Y = \alpha + ß \ln K + \rho \ln (a*H + M)$

ECONOMETRIC PROBLEM

Exponent is taken on both sides to remove natural logarithm for Y (GDP) on LHS and compute a value for RHS

2. $M / H = a*b / (1-b)$

FLOW OF DATA (backing 'a' out)

M/H = Computer (in US$m) to labour (in man-hours) ratio
a = backed-out from this equation
b = [0,1] - substitutability frontier

Variables:
GDP (1st)
TFP + Unit diff (1st)
Capital coeff (2nd)
Labour coeff (1st)
Advantage (2nd)
Man hour ratio (1st)
Computer capital (1st)
Substitutability (1st)

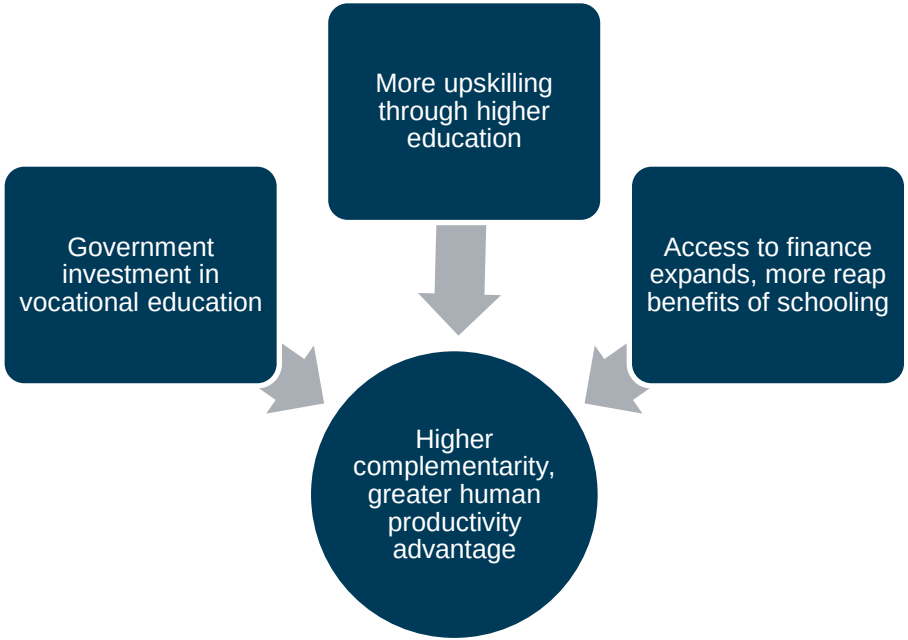
1st = derived
2nd = forecaster controlled

Scenario overview

Scenario 1 (optimistic case – complementary effect)

Greater human productivity advantage through upskilling

Modifying The EIU's baseline to accommodate a **higher degree of complementarity between labour and machine learning** than is presently anticipated.

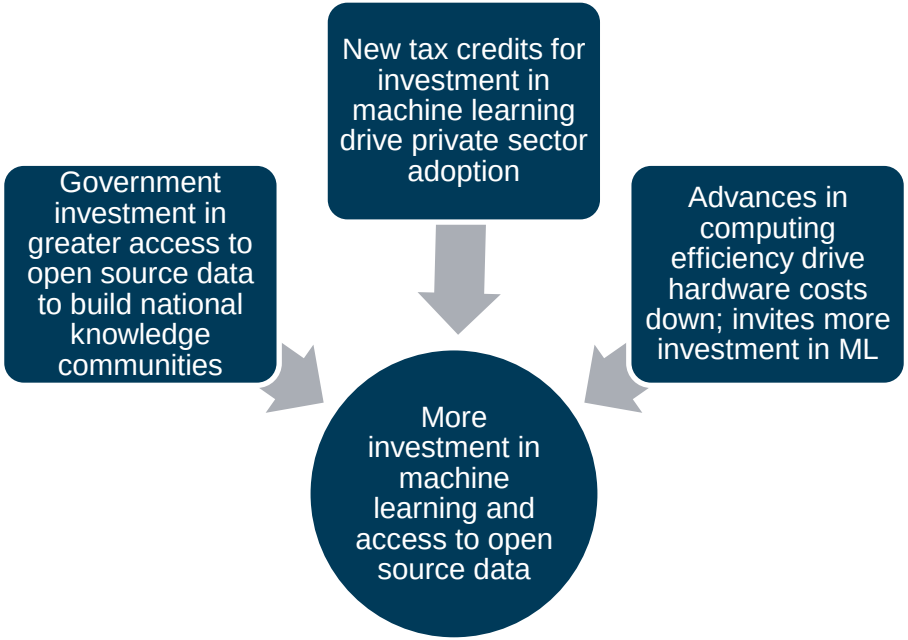


Scenario overview

Scenario 2 (optimistic case – complementary effect)

Greater investment in technology (automation) and access to open source data

Greater computer capital investment is the impetus for the broader proliferation of machine learning relative to our baseline forecast, **wherein automation / machine learning's complementary effect dominates its substitution effect.**

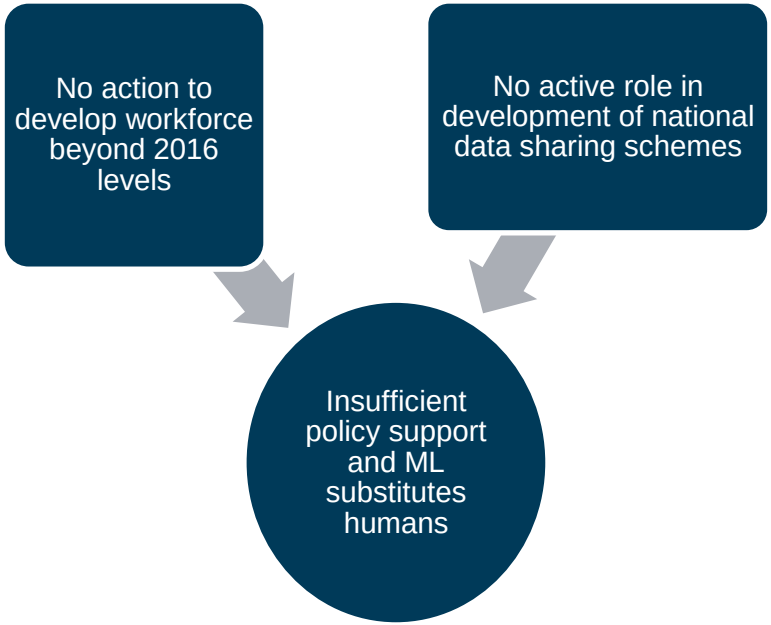


Scenario overview

Scenario 3 (negative case – substitution effect)

Insufficient policy support for structural changes in the economy

- **Substitution effect dominates the complementary effect**.
- Humans' productivity advantage over machines (a) falls, while the share of tasks machines can perform (b) rises.
- Machine learning substitutes labour as hours worked (H) fall due to involuntary unemployment.



Economic policy must focus on three main aspects

Policy makers need to act in three key areas to promote a knowledge-based economy with a focus on human capital; mainstreaming and targeting

Protected individuals
regulation

Data regulation and privacy protection is critical

- Rise in digital transactions
- 30% of ASEAN countries have privacy legislation
- 60% have consumer protection regulation

Digital infrastructure
investment

Targeted investment for connectivity and innovation is essential

- Focus on internet inclusion (+ gender dimension)
- 4G coverage in Asian countries is rapidly improving

Capacity building
upskilling

Education and training needs to focus on 21st-century skills

- Transform educational curricula to focus on ICT and STEM subjects
- Technical and vocational training & work-based learning

Social policy has to encompass the following areas

Policy makers need to put appropriate social protections in place to drive positive impact from automating public services in a digital economy

Service delivery

Leverage automation to make public services more efficient, personalised and predictive

- AI can support SDGs by freeing up government resources
- Healthcare is a key beneficiary of data driven services

Security guarantees

Safety nets such as direct cash transfers are important development tools

- Foundation of a resilient labour market
- Can ensure smooth transition of the work force
- DFS, G2P transfer systems

Employment programmes

Counter the pressures of unemployment through alternative methods

- Employment guarantees offer a set number of workdays to most vulnerable
- India's National Rural Employment Guarantee Act

Environmental policy should promote three main areas

Policy makers can leverage current technologies to achieve environment-related SDGs

Energy efficiency

Emerging technologies can reduce energy use by industries

- IAEA estimates energy use can be reduced between 13%-29% by implementing emerging technologies
- Fiscal incentives (eg custom exemptions) can be explored

Precision agriculture

Precision techniques alleviate challenges of productivity and waste

- Asia is a lead market for alternative agricultural techniques (soilless, vertical)
- Important tool for food security

Resource extraction

Automating mining processes has benefits such as improved efficiency and labour protection

- Robots, virtual modelling and sensors will manage mines “within a decade”
- Allows for extraction of materials that are “problematic”

Thank you, any questions?

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